

DOCUMENT REVIEW AND COMMENT

DOCUMENT **Site Investigation Report – Exide Frisco Recycling Center, Frisco, Texas**
DATE **July 12, 2012**
BY **Pastor, Behling, & Wheeler, LLC (PBW)**

Review Summary

The report prepared by PBW documents the performance of site investigation activities at the Exide Technologies (Exide) Frisco Recycling Exide Frisco Recycling Center in Frisco, Texas (Site). The investigation was performed in accordance with a Sampling and Analysis Work Plan (Work Plan) dated November 14, 2011 and approved by the Environmental Protection Agency (EPA) on December 2, 2011. According to the above report, the investigation was conducted to fulfill requirements of an Administrative Order on Consent (AOC) dated May 2, 2012 issued to Exide.

Sampling efforts included soil, groundwater, sediment, and surface water sampling at the Exide facility and comparison of the results to the Texas Risk Reduction Program (TRRP) criteria. According to the report, the Site was a secondary lead smelter and lead recycling facility that has operated since 1964. Recycled material has included spent lead-acid batteries and lead-bearing scrap that was smelted and refined to produce lead, lead alloys, and lead oxide. Features at the Site include battery breaking operations, raw storage, a blast furnace, oxidation production facility, one (1) active non-hazardous landfill, "several closed landfills," a waste water treatment plant, and a storm retention pond.

The investigation report summarized recent data collected at the Site including:

- 57 soil samples
- 10 background soil samples
- 15 Stewart Creek sediment samples
- 10 North Tributary samples
- 15 Stewart Creek surface water samples
- 2 Background monitor wells
- 5 Reconnaissance monitor wells
- 12 Groundwater samples
- 3 Test trenches
- 4 Investigation-derived waste samples

The majority of sample analysis included cadmium and lead with a few selected media samples evaluated for other chemicals of concern (COCs). The report notes that the AOC required an evaluation of "extent of COCs" in accordance with TRRP Protective Concentration Levels (PCLs). Additionally, the report utilized a commercial criteria of 1,600 mg/Kg and 850 mg/Kg for lead and cadmium, respectively, to delineate possible concerns. Additionally, the historic data selected for representation does not appear to include all prior regulatory or RCRA sampling events, but does contain data in excess of 20 years old in areas that have remained operational.

The report offers an area-based conclusion and recommendation for the following areas:

- **North Disposal Area (NDA):** Two (2) soil samples exhibited exceeded the noted lead above 1,600 mg/Kg PCL outside the NDA boundary with lead concentrations of up to 30,200 mg/Kg observed. PBW recommended a combination of surface soil excavation and expansion/repair of the current NDA cap to address the C/I PCL exceedances.
- **Slag Landfill:** Slag was encountered over 50 feet west of the documented landfill unit at a depth of 2-4 feet below grade. PBW noted that prior interviews with plant personnel was suggestive that slag may extend outside the recorded landfill boundaries. PBW recommended a combination of surface soil excavation and expansion/repair of the current slag landfill cap to address the occurrence of slag waste and C/I PCL exceedances.
- **Southern Disposal Area (SDA):** PBW noted that "none" of the 10 PBW SDA borings exceeded C/I PCLs. However, several exceedances of the C/I PCL of 1,600 mg/Kg were noted on the provided summary figure (Figure 19) which depicts lead concentrations of up to 28,800 to be present outside the current SDA boundaries generated during prior investigative efforts. Of the PBW borings, lead ranged up to 1,090 mg/Kg within a two foot composite sample (0-2') approximately 200 feet from the SDA limits. PBW recommended focused excavation/capping along with removal of incidental battery cases or slag.
- **Boneyard:** The boneyard is partial noted to be above the former slag landfill discussed above. Similar to the summary above, slag was encountered southwest of the former slag landfill boundaries with a resulting lead concentration of 47,000 mg/Kg estimated across the 0-2' interval. PBW recommended actions consistent with the slag landfill discussion noted above.
- **Bail Stabilization Area:** PBW noted three (3) locations where the C/I PCL for lead was exceeded. Additionally, one occurrence of a C/I cadmium PCL (850 mg/Kg) exceedance was noted. The bail stabilization area overlies a portion of the NDA with some of the noted exceedances being outside the currently depicted

boundaries. PBW recommended excavation and extension of the NDA cap to address the elevated lead and cadmium findings.

- **Stewart Creek Flood Wall - Creek Side:** One C/I lead PCL exceedance was noted with additional delineation recommended during construction of a french drain system.
- **Crystallization Unit Frac Tank:** No C/I PCL exceedances were noted within the two samples collected.
- **Shooting Range Berm:** Three test trenches were advanced into the existing berm to determine if bullets, battery casings, slag or other foreign objects were present throughout. Based on the effort, PBW appears to have only identified foreign material was present superficially along the eastern face. PBW recommended removal of berm soils with slag/battery casings and collection of surface samples. No sampling was performed.
- **Sediment & Surface Water Sampling (Stewart Creek):** None of the 25 sediment samples exceeded ecological benchmark criteria. Of the 15 surface water samples collected, only two dissolved samples exhibited concentrations above critical PCLs. However, the results were considered isolated and since no detectable arsenic or cadmium were noted near the actual facility, no further action was recommended.
- **Groundwater Sampling:** The groundwater gradient was noted to be to the south with a northern gradient along the southern facility boundary. PBW utilized the groundwater-to-surface water PCL for evaluating sample results. No exceedances were noted and no further action recommended

Additional observations from the report included:

- A background soil evaluation was included within the site investigation effort. While not extensively detailed in the report (Section 4.1.3), this included the collection of 10 soil samples from the surface to two feet below grade from the City of Frisco's Grand Park approximately 5,000 feet southwest of the Site. A wide range of results were noted for arsenic (9.29 mg/Kg to 12.6 mg/Kg), cadmium (<0.0287 mg/Kg to 8.09 mg/Kg), and lead (11.5 mg/Kg to 302 mg/Kg).

General Comments

The PCL evaluation utilized for effort assumed TRRP Commercial/Industrial Tier 1 ^{Tot}Soil_{Comb} PCLs exclusively. While this may be an applicable component to the property assessment effort, TRRP requires an evaluation of multiple pathways as part of the assessment process. For example, a) the extent of impact to a Residential Assessment Level (RAL) must be determined before the C/I criteria can be applied, b) the use of C/I criteria under TRRP requires deed recordation of the property for use exclusive as C/I in accordance with TRRP, and c) all possible

exposure pathways under C/I must be evaluated. The TotSoilComb PCL is 500 mg/Kg. It should be noted that this is twice the former RSR Smelter cleanup goal in Dallas of 250 mg/Kg and also above the default EPA criteria used for soil of 400 mg/Kg. Based on this information, it does not appear that this investigation was completed in accordance with the EPA AOC requirements.

The report also assumes that a Municipal Setting Designation (MSD) is present to allow removal of the TRRP groundwater ingestion pathways. This is not currently the case and requires both municipal, surround retail public utility, and state concurrence before this is in place. Further, the EPA has previously not allowed use of an MSD on RCRA-based projects, so this may not be an accurate assumption.

While extensive aquifer testing was performed on the upper groundwater-bearing unit (GWBW) to determine, a summary of the average hydraulic conductivity (K) used as part of the TRRP assessment process is not included. From a brief look at the provided slug testing data in Appendix F, it appears that much of the upper GBWU would be above the K of 10^{-5} utilized as a part of the characterization data to lessen groundwater ingestion criteria (Class 3 or saturated soils) and either meet Class 1 or Class 2 requirements under TRRP. This may be due to the assumed MSD consideration of the Site discussed earlier, but a limited discussion of aquifer evaluation efforts and conclusions based on TRRP-8 would be recommended.

Since the report contains new geoscientific information, the report should include the seal of either a Professional Engineer or Professional Geoscientist registered in Texas.

A discussion of key concerns of note are included individually below.

Key Concerns included:

- **Background Metal Evaluation:** Background evaluation for arsenic, cadmium and lead. It would seem prudent to utilize the background data in an evaluation of the lateral and vertical "extent of COCs" required under the AOC. Using the efforts documented in this report, a typical background evaluation done under TRRP can be performed. For example, if the highest and lowest observations are removed to better normalize the data and half of the reported cadmium detection limit is assumed to be a representative value, the resulting mean background values obtained for arsenic, cadmium and lead are 11.3 mg/Kg, 21.9 mg/Kg, and 0.10 mg/Kg.

Further, an estimated 95% upper prediction limit (95% UPL) for arsenic, cadmium and lead would be 14.7 mg/Kg, 0.53 mg/Kg, and 59.7 mg/Kg. The 95% UPL represents a general background estimate generally allowed by the TCEQ for TRRP projects. This means the anticipated background value for lead would be no more than 60 mg/Kg 95% of the time.

- **Sampling Intervals:** Soil sampling by PBW included collection of soil across two foot intervals rather than the half foot intervals evaluated previously. By doing this, a resulting composite value is derived that would be anticipated to bias the result low for shallow impacts. By mixing prior method results with this compositing approach, a poorer understanding of the actual exposure at the surface (i.e. 0-0.5') results.
- **Delineation Goals:** All assessment should achieve attainment of either background or residential (i.e. RALs) goals to confirm the limit of impact under TRRP. The C/I limits can then be utilized for remedial decisions provided no RAL exceedences extend off the Site. While this may be a forgone conclusion due to the facility size and anticipated areas of impact, if TRRP is being applied for risk-based characterization, then it would be advantageous to complete these required TRRP steps. Additional depiction of Residential PCLE Zones as well as when applicable, additional delineation, is recommended.
- **Comprehensive Site Understanding:** There have been multiple investigations completed for the Site since the 1990s. While many of these efforts may have included use of wide range analyses (i.e., priority pollutant metals, volatile organic compounds, petroleum hydrocarbons, semi-volatile organic compounds) or have been for areas previously addressed through remedial actions, a discussion of prior sampling results considered to be currently representative should be included in a report of this nature. This would help in understanding why a limited suite of compounds were analyzed, if prior assessment data would be representative after operations have continued after investigation efforts, and better aid the reviewer in comparison of current data vs. historic operational concerns. By selectively presenting partial data sets, a comprehensive site understanding cannot be had. All data from federal, state, and private entities should be included in this evaluation.
- **NDA/Bail Stabilization Area:** With the exception of TS-2, none of the other 14 surface samples were below the 95% UPL for lead. Further, nine (9) of the sample points exhibited lead above 500 mg/Kg. Delineation to TRRP RALs has not been completed. Additionally, the identification of exposed battery chips and slag during a 2010 inspection performed by the EPA (documented in the August 2011 Unilateral Administrative Order) should necessitate a higher frequency of confirmation sampling to ensure additional exceedences outside the landfill boundaries are not present. Additional lead and cadmium exceedences were not within the bail stabilization area noted on and immediately east of the NDA. Based on this, further confirmatory delineation appears warranted.
- **Slag Landfill/Boneyard:** Soil samples to the north of the slag landfill were not suggestive of impact in this direction. However, no sampling data was presented to

the east or south of the depicted landfill units. Additionally, a “boneyard” area with documented slag-containing equipment overlies the western slag landfill was evaluated and noted to exhibit slag southwest of the landfill boundaries. Further, a boring advanced west of the bonyard and landfill limit encountered slag waste material. Based on the potential for recent surficial impact and confirmation that the limits of waste are not known, additional delineation appears warranted. Several soil samples exceeded both the 95% UPL and RAL for lead.

- **SDA:** As with other assessment efforts, delineation to the TRRP RAL was not completed with lead exceeding 500 mg/Kg at the northernmost sample point.
- **Stewart Creek Flood Wall:** Further evaluation of both the C/I PCL exceedance and RAL exceedance appear warranted. Further, given the proximity to a surface water feature, use of ecological goals (i.e., lead midpoint of 81.9 mg/Kg) in addition to human health goals appears warranted in this evaluation. Figure 18 also provided a summary of the “Raw Material” storage area near the flood wall investigation and noted a lead concentration of 2,950 mg/Kg which should be further evaluated.
- **Crystallization Unit Frac Tank:** While the two soil samples collected did not exhibit metal concentrations above anticipated background levels, the resulting sulfate concentrations (7,370 mg/Kg and 8,190 mg/Kg) should be considered elevated and of interest for potential longer term use of concrete in this area. For example, the Portland Cement Association (www.cement.org) notes that soil with a total sulfate concentration of 5,000 to 8,000 mg/Kg is considered a moderate to high risk while over 8,000 mg/Kg is considered a very high risk for expansion and impact to engineered features. From the limited data provided, it is unclear if this is anthropogenic or natural in occurrence.
- **Shooting Range Berm:** It is unclear why actual sampling was not performed. Assessment of this area should be performed in the future to confirm if lead, or other COCs, are present above regulatory criteria.

Review Conclusion

If remedial decisions are going to be made based on the presented information, additional assessment and representation consistent with the TRRP process (i.e., PCLE documentation within an APAR) is recommended. While the final remedial criteria utilized will be set by either the TCEQ or EPA, the above comments are based on the existing rules and precedents for similar site closure efforts in Texas.